

SUPPORT FOR THE AMENDMENTS

The amendment to the paragraph beginning on page 27, line 29, in the specification corrects an obvious error. There is no x index in formula III.

The amendments of Claim 1 correct the Formulae to show all bonds necessary to describe the tetravalency of carbon.

Claim 1 is also amended to use wording and structure consistent with U.S. patent law practice.

No new matter is believed added to this application by entry of this amendment.

Claims 1-17 are active.

REMARKS/ARGUMENTS

The claimed invention provides a lubricant composition as described in Claim 1 and claims dependent thereon, for modern gearboxes, engines and hydraulic pumps which contains highly effective friction modifying additives that are stable to oxidation and thermal stress, have increased solubility in nonpolar lubricant oils and improve the flow properties of the lubricant oil.

The rejection of Claims 1-9, 13-14 and 17 under 35 U.S.C. 103(a) over Mishra et al. (U.S. 5,834,408) is respectfully traversed.

Mishra describes acrylic an acrylic copolymer obtained by anionic polymerization of the following acrylic monomers:

- a) 0-60% $\text{CH}_2=\text{C}(\text{R})-\text{C}(\text{O})-\text{O}-\text{R}_1$ wherein R_1 is C_{1-5} alkyl;
- b) 0-60% $\text{CH}_2=\text{C}(\text{R})-\text{C}(\text{O})-\text{O}-\text{R}_2$ wherein R_2 is C_{6-14} alkyl; and
- c) 15-80% $\text{CH}_2=\text{C}(\text{R})-\text{C}(\text{O})-\text{O}-\text{R}_3$ wherein R_3 is C_{15-22} alkyl. (Claim 1)

At least one of a) and b) is present and the total amount of a) and b) is from 20-85 weight per cent. Mishra requires a polydispersity index of from 1 to 1.5. Other monomers may be

added to the polymerization (Col. 3, lines 20-39). The polymer may be random or block (Col. 4, lines 9-11). However, in order to obtain the desired polydispersity random polymers are preferred (Col. 4, lines 31-34).

The Office has noted that a) corresponds to formula I of the present invention and both b) and c) correspond to formula II (Official Action dated May 13, 2009, page 4, lines 2, 8 and 13). The Office has also pointed to Col. 3, lines 27-39 of the reference as reading on formula III (Official Action dated May 13, 2009, page 5, lines 1-2).

Applicants note that Mishra does not require a copolymer containing both a) and c) and in fact the reference copolymer could consist of all b) and c) (corresponding to formula II of the present invention). Nowhere does this reference disclose or suggest that a) must be present. Applicants also note that Mishra provides no examples of block copolymers. All the examples shown in Table 1 are random (Col. lines 49-54) copolymers and no examples containing polar monomers of formula III of the present invention are provided. Furthermore, nowhere does Mishra disclose or suggest that the copolymer be of the block type wherein the polar component is present in a block of at least three repeating units as according to the claimed invention (Claim 1; formula III, n is 3 or more).

Applicants note that in reversing an obviousness rejection in *Ex parte* SUSUMU TANAKA and YASUO MURAKAMI (Appeal 2007-3845; Decided: March 28, 2008) the Board of Patent Appeals and Interferences stated:

In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)

Applicants respectfully submit that nowhere does Mishra disclose, suggest or provide motivation that would have led one of ordinary skill in the art, at the time of invention to the present invention as described in Claim 1.

Moreover, Applicants submit that nowhere does Mishra disclose or suggest that significant improvement in frictional value at low speeds could be obtained by employing the block copolymer composition according to the claimed invention. In contrast, Applicants have shown significant improvement in friction reduction at low speeds due to use of a block copolymer according to the present invention in the examples in the specification. Figure 2 shows the significantly lower friction coefficient obtained with the block copolymer of Example 5 of the present invention in comparison to Comparative Example 5, which differs in being a random copolymer of the same monomer composition.

In view of all the above, Applicants submit that Mishra can neither anticipate nor render the claimed invention obvious and withdrawal of the rejection of Claims 1-9, 13-14 and 17 under 35 U.S.C. 103(a) over Mishra is respectfully requested.

The rejection of Claims 10-12 under 35 U.S.C. 103(a) over Mishra in view of Pappas et al. (U.S. 3,816,314) is respectfully traversed.

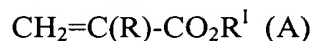
Claims 10-12 all depend directly or indirectly from Claim 1 and therefore include the description of the independent claim. The deficiencies of Mishra with respect to Claim 1 have been described above.

The Office has indicated that Mishra discloses monomer with hydrophobic segments and monomers with polar segments (Official Action dated May 13, 2009, page 6, lines 1-2). Applicants again point out and the Office apparently recognizes that Mishra does not disclose or suggest a block copolymer structure having a polar block with 3 or more repeating units. The Office does acknowledge that (Official Action dated May 13, 2009, page 6, lines 2-5):

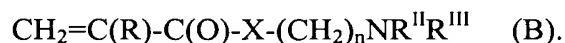
Mishra does not, however, disclose a concentration range for the monomers with polar segments and therefore Mishra does not disclose a weight ratio between the two segments. Mishra also does not explicitly disclose weight average degree of polymerization of the hydrophobic or polar segments.

Pappas is cited to show a weight ratio of polar and nonpolar segments.

Pappas describes an oil additive which is an oil soluble block copolymer of a comonomer A of the formula:



and comonomer B of the formula:



R^I in formula (A) is a C₈ to C₂₂ substantially straight chain alkyl group. Nowhere does this reference disclose or suggest a lubricant composition comprising a block copolymer according to the claimed invention where the hydrophobic segment P comprises one or more ethylenically unsaturated ester compounds of formula (1) where R^I is a linear or branched alkyl radical having 1 to 5 carbon atoms and one or more ethylenically unsaturated ester compounds of formula (11) where R⁴ is a linear or branched alkyl radical having 6 to 30 carbon atoms.

In view of the above, Applicants respectfully submit that the cited reference cannot cure the deficiency of Mishra previously described and therefore the cited combination of references cannot render the claimed invention obvious. Accordingly, withdrawal of the rejection of Claims 10-12 under 35 U.S.C. 103(a) over Mishra in view of Pappas is respectfully requested.

The rejections of Claims 15 and 16 under 35 U.S.C. 103(a) over Mishra in view of Nesvadba et al. (U.S. 2004/0242813) and Benicewicz et al. (U.S. 2003/0060577) respectively, are respectfully traversed.

Applicants respectfully note that Claims 15 and 16 depend from Claim 1. The deficiency of the primary reference was described above.

Nesvadba is cited to show an initiator with a transferable atom group.

Nesvadba describes a process for the preparation of hydroxyl-vinyl-aromatic polymers by anionic radical polymerization (Abstract). Nowhere does this reference disclose or suggest a block copolymer according to Claim 1 and therefore, Nesvadba cannot cure the deficiency of the primary reference.

Benicewicz is cited to show a dithiocarboxylic ester.

Benicewicz describes a process for preparing dithiocarboxylic esters. This secondary reference is not directed to the preparation of block copolymers according to Claim 1 of the present invention and therefore cannot cure the deficiencies of the primary reference.

In view of the above, Applicants submit that the cited combinations of references cannot render the claimed invention according to Claims 15 and/or 16 obvious and withdrawal of the rejections of Claims 15 and 16 under 35 U.S.C. 103(a) over Mishra in view of Nesvadba and Benicewicz respectively, are respectfully requested.

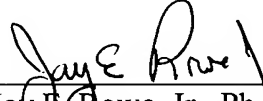
The objection to Claim 1 is believed obviated by appropriate amendment. Formula (III) is herein corrected by amendment. Withdrawal of the objection is respectfully requested.

Application No. 10/550,764
Reply to Office Action of May 13, 2009

Applicants respectfully submit that the above-identified application is now in
condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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